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AN ENCYCLOPEDIA OF
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THIRTEENTH EDITION

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Stannous Iodide

8864

8852. **Stannic Chloride.** [7646-78-8] Tin tetrachloride; tincture of Libavius. Cl_4Sn ; mol wt 260.52. Cl 54.43%, 45.57%. SnCl_4 . Improperly called "tin bichloride".

Ammon. caustic liquid. d 2.26; mp -33°; bp 114°. Sol in water and evolution of much heat; sol in alcohol, carbon tetrachloride, benzene, toluene, acetone, kerosene, gasoline. *Keep well closed.*

Hydrate. White or slightly yellow crystals or fused small lumps; slight HCl odor. Very sol in H_2O ; sol in alc.

Caution: May be highly irritating to eyes, mucous membranes.

Use: As mordant; reviving colors; stabilizer for colors and tints in soap; in dyeing of fabrics, weighting silk, tanning leather; dehydrating agent in organic syntheses; in ceramics to produce abrasion-resistant or light-reflecting coatings.

8853. **Stannic Chromate(VI).** [38455-77-5] $\text{Cr}_2\text{O}_3\text{Sn}$; mol wt 350.69. Cr 29.65%, O 36.50%, Sn 33.85%. $\text{Sn}(\text{CrO}_4)_2$. Brownish-yellow, cryst powder; dec when heated. Sol in water.

Use: Decorating porcelain and china in rose and violet colors.

8854. **Stannic Fluoride.** [7783-62-2] Tin tetrafluoride. SnF_4 ; mol wt 194.70. F 39.03%, Sn 60.97%. SnF_4 . Lewis acid. Prepd from SnCl_4 and HF. Ruff, Plato, *Ber.* 37, 673 (1904); or from stannous fluoride and chlorine or bromine: Forbes, *Anal. J. Am. Chem. Soc.* 67, 1911 (1945); from stannous oxide fluoride and fluorine: Haendler *et al.*, *J. Am. Chem. Soc.* 76, 79 (1954). *Review:* Kemmitt, Sharp, *Advan. Fluorine Chem.* 4, 186 (1965).

Yellow-white, tetragonal crystals. Very hygroscopic. d²⁰ 4.78. Melts at 705°. Hydrolyzes readily, but is more resistant to water than stannic chloride. Forms complexes with donor molecules.

Use: Friedel-Crafts catalyst.

8855. **Stannic Iodide.** [7790-47-8] Tin tetraiodide. I_4Sn ; mol wt 626.33. I 81.05%, Sn 18.95%. SnI_4 . Toxicity data: *et al.*, *J. Pharm. Exp. Ther.* 43, 515 (1931).

Yellow to reddish crystals. d 4.46. mp ~143°; sublimes at ~180°. bp 340°. Dec by water; sol in alcohol, benzene, carbon ether, carbon disulfide. MLD in rats (mg/kg): 200 (solmer).

8856. **Stannic Oxide.** [18282-10-5] White tin oxide; tin white; stannic anhydride; flowers of tin. O_2Sn ; mol wt 150.71. 43%. Sn 78.77%. SnO_2 . Occurs in nature as the mineral cassiterite. The commercial grade is also known as *polishing putty powder*, or *tin ash*.

White or slightly gray powder. d 6.95. Insol in water, alcohol, cold acids. Slowly sol in hot concd potassium or sodium hydroxide soln.

Caution: Potential symptoms of overexposure are stannosis (a pneumoconiosis); dyspnea, decreased pulmonary function. *See NIOSH Pocket Guide to Chemical Hazards* (DHHS/NIOSH-97-140, 1997) p 308.

Polishing glass and metals; manuf milk-colored, ruby cluster glass, enamels, pottery, putty; mordant in printing fabrics; in fingernail polishes.

8857. **Stannic Selenide.** [20770-09-6] Tin diselenide. SnSe_2 ; mol wt 276.63. Se 57.09%, Sn 42.91%. SnSe_2 . Prepd using the vapor of selenium over heated tin: Little, *On and Some of the Metallic Selenides*, Göttingen (Thesis, 1919); by treating a soln of stannic chloride with hydrogen selenide, cited in *Mellor's* vol. X, 785 (1930); by treating tin with an alkali selenostannate or sulfoselenostannate with sulfuric acid: Ditté, *Compt. Rend.* 95, 641 (1882).

Yellowish brown crystals. d 5.133 (Little); d 4.85 [Schneider, *Pogg.* 624 (1866)]. mp 650°. Soluble in alkali, concd sulfuric acid, aqua regia, aq ammonia. Insol in water, dilute acids.

Forms potassium selenostannate with potassium selenide; sodium selenostannate with sodium selenide.

8858. **Stannic Sulfide.** [1315-01-1] Tin disulfide; mosaic bronze. S_2Sn ; mol wt 182.84. S 35.07%, Sn 64.93%.

Golden leaflets with metallic luster; fatty feel to the touch. d 4.5. Insol in water or dil acids. Sol in aqua regia, in solns of alkali hydroxides or sulfides.

Note: The term "mosaic gold" is also used to designate an alloy consisting of 65.3% copper and 34.7% zinc.

Use: Gilding and bronzing metals, gypsum, wood and paper, usually by suspending in lacquer or varnish.

8859. **Stannous Acetate.** [638-39-1] $\text{C}_4\text{H}_8\text{O}_2\text{Sn}$; mol wt 236.80. C 20.29%, H 2.35%, O 27.03%, Sn 50.13%. $\text{Sn}(\text{C}_2\text{H}_3\text{O}_2)_2$. Prepd by refluxing granulated tin with 98% acetic acid: Colonna, *Gazz. Chim. Ital.* 35 II, 224 (1905); by refluxing SnO with 50% (v/v) acetic acid under nitrogen: Donaldson *et al.*, *J. Chem. Soc.* 1964, 5942.

White, orthorhombic crystals; dec by water. mp 182.5-183°. d 2.31. Sol in dil HCl. *Keep well closed.*

Use: Reducing agent.

8860. **Stannous Bromide.** [10031-24-0] Tin dibromide. Br_2Sn ; mol wt 278.52. Br 57.38%, Sn 42.62%. SnBr_2 .

Yellowish powder; oxidizes in air. d 5.12; mp 215°; bp 623°. Sol in little water, gradually dec by much water; sol in alcohol, ether, acetone. *Keep tightly closed and protected from light.*

8861. **Stannous Chloride.** [7772-99-8] Tin dichloride; tin protochloride; Stannochlor. Cl_2Sn ; mol wt 189.62. Cl 37.39%, Sn 62.60%. SnCl_2 . Prepn: Stéphen, *J. Chem. Soc.* 1930, 2786; Williams, *Org. Syn. coll. vol. III*, 627 (1955). Metabolism and toxicity studies: M. Marchiak, *Acta Physiol. Pol.* 32, 193 (1981); P. P. Singh, A. Y. Junnarkar, *Ind. J. Pharmacol.* 23, 153 (1991).

Orthorhombic cryst mass or flakes; fatty appearance. bp 247°; d 3.95. Sol in water, ethanol, acetone, ether, methyl acetate, methyl ethyl ketone, isobutyl alcohol. Practically insol in mineral spirits, petr naphtha, xylene. LD₅₀ in mice, rats (mg/kg): 1710.0, 2000.0 orally; 271.0, 316.0 i.p.; 34.8, 43.0 i.v. (Singh, Junnarkar).

8862. **Stannous Fluoride.** [10025-69-1] $\text{Cl}_2\text{Sn} \cdot 2\text{H}_2\text{O}$. Crystals; absorbs oxygen from air and forms insol oxychloride. d 2.71. mp 37-38° when rapidly heated; dec on strong heating. Sol in less than its own wt of water; with much water it forms an insol basic salt; very sol in dil or in concd hydrochloric acid; also sol in alcohol, ethyl acetate, glacial acetic acid, sodium hydroxide soln. *Keep tightly closed, in a cool place.*

Use: Powerful reducing agent, particularly in manuf of dyes and ^{99m}Tc radiopharmaceuticals; in tinning by galvanic methods; in liquor finishing of wire; in sensitizing of glass and plastics before metallizing; as soldering flux; as mordant in dyeing with cochineal; in manufacture of tin chemicals, color pigments, pharmaceuticals, sensitized paper, lubricating oil additives; as tanning agent; in removing ink stains; in yeast revivers; as reagent in analytical chemistry; as catalyst in organic reactions.

8863. **Stannous Hexafluorozirconate(IV).** [12419-43-1] Stannous fluozirconate(IV). F_6SnZr ; mol wt 323.92. F 35.19%, Sn 36.65%, Zr 28.16%. SnZrF_6 . Prepd from ZrF_4 and SnF_2 : Muhr, US 3266996 (1966 to Indiana University Foundation).

Crystals. d 4.21. Sol in water.

Use: In anticaries preparations.

8864. **Stannous Iodide.** [10294-70-9] Tin diiodide. I_2Sn ; mol wt 372.52. I 68.13%, Sn 31.87%. SnI_2 . Preparation and crystal structure: Moser, Trecena, *Chem. Commun.* 1969, 25. Red, cryst powder or needles. d 5.28; mp 320°; bp 720° with decompr. Slightly sol in and dec by water; sol in solns of alkali